UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,627	08/08/2005	Shigeo Shirakura	Q85332	3522

23373 7590 04/21/2010

SUGHRUE MION, PLLC
2100 PENNSYLVANIA AVENUE, N.W.
SUITE 800
WASHINGTON, DC 20037

EXAMINER	
LIAO, DIANA J	

ART UNIT	PAPER NUMBER
1793	

NOTIFICATION DATE	DELIVERY MODE
04/21/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

sughrue@sughrue.com
PPROCESSING@SUGHRUE.COM
USPTO@SUGHRUE.COM

Office Action Summary	Application No.	Applicant(s)	
	10/518,627	SHIRAKURA, SHIGEO	
	Examiner	Art Unit	
	DIANA J. LIAO	1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 April 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. Arguments filed on 4/7/10 regarding the claimed use of "consists of" language have been considered and found persuasive. The rejection under 35 U.S.C. 103(a) based on Dittmer, et al. (US 6,241,826) has been withdrawn. However, it should be noted that the independent claim does not claim that there is no ultrasonic treatment, nor does the specification support this limitation. A new grounds of rejection follows in this non-final office action.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 3, 4 and 9-15 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 3 and 4 recite the limitation that the NO_x catalyst removed from the regeneration water is washed with water. Since the method of claim 1, from which both claims ultimately depend, uses "consisting of" language, dependent claims may not add an additional step. (See MPEP §2111.02)

Claims 9-15 recite steps which occur to a "catalyst having been regenerated" or a "regenerated NO_x removal catalyst". These steps occur after the process of claim 1 and do not properly further limit the independent claim. The method of claim 1 is drawn to

the regeneration of a catalyst which consists of only steps to immersing the catalyst, removing the catalyst from water, removing water from the catalyst, and treating the regeneration water. Claims 9-15 do not further limit this process, but rather add additional steps to either regenerating the catalyst, which is not permitted for reasons discussed earlier, or are drawn to a different process.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider, et al. (US 6,232,254).

Schneider '254 teaches a method for cleaning and/or regenerating a deactivated catalyst for use in nitrogen scrubbing (a NOx removal process). The method utilizes demineralized water. (abstract) The water is used to dissolve and remove the surface

layer of the catalyst. (col 3, lines 5-8) The cleaning and regeneration of the catalytic devices is performed at ambient temperatures. (col 3, lines 20-22)

Schneider '254 also teaches a process, represented by Figure 3, where the catalysts are contacted with demineralized water in a scrubber (6) and the used regenerating fluid is sent to a separator (8) and later a settling tank (9) with the overflow of liquid sent through lines (12, 13) directly back into the tank for desalinated water (11) where it immediately and reused and sent back as regenerating fluid to the scrubber (6). Water which is particularly contaminated with solids are taken from the bottoms of the settling tank (9) and sent through a line (10) to a water treatment plant. (described col 4, lines 10-33) This manner in which some of the regenerating water is re-used and some water is sent to a treatment plant is found to meet the claimed limitations in instant claims 5-8.

The catalytic device may be contacted with the water by closing off the honeycombs of the device or closing off the reactor (6). This bath is maintained as catalytic poisons are removed from the pores and into the regenerating fluid. The regenerating fluid is later drained. (col 4, lines 43-58) The catalyst may be dried using stack gas or hot air. (col 4, lines 58-59)

Although Schneider '254 does not specifically teach that the catalytic device is assessed and reinstalled after the regeneration process, these steps are found to be implicit or obvious over Schneider '254. The purpose of regenerating a catalytic device is to reuse it and reinstall it into the process. It would have also been obvious or inherent to have assessed the performance of the catalyst before installation in order to

be sure that regeneration has occurred and to make sure that the removal capacity is satisfactory for the process. The example shown in Schneider '254 (col 5, lines 20-40) also demonstrates that the catalyst was tested for performance. One of ordinary skill in the art would at least periodically assess the effectiveness or quality of a catalyst before reinstalling a regenerated catalyst into an apparatus since catalysts need to be replaced from normal use even if almost fully regenerated. Assessing the catalyst before reinstallation could involve another isolated apparatus without dealing with the general, possibly continuous, industrial process. Therefore it would be obvious to test catalyst activity before installation in order to avoid putting an ineffective catalyst into the main operations.

Regarding bubbling occurring from the NO_x removal catalyst while in the regeneration fluid, it is inherent that a porous catalyst previously exposed to gases would release air bubbles from its pores as it is in a water bath. The mechanism for regeneration requires that the catalyst poisons are transferred from the pores to the fluid, thus requiring fluid to replace any air in the pores.

The differences between the instant claims and Schneider '254 are that Schneider '254 does not specify a "columnar" honeycomb structure, a treatment time of 1-30 minutes, a washing step is not added after removing water from the catalyst, and the wastewater treatment is does not specifically exclude a heavy metals treatment.

Regarding the honeycomb structure, Schneider '254 does specify that a honeycomb is being regenerated but does not make specific mention of the general characteristics of the overall device. However it would have been obvious to perform this process on any honeycomb structure, given the generic teaching. The process involves pores and water, which is not dependent on the overall shape of the honeycomb.

Regarding a treatment time, Schneider '254 recites that the bath for the catalyst is maintained for a defined period of time (col 4, line 56) and Schneider '254 does not recite a range of 1-30 minutes as instantly claimed. However, it would have been obvious to one of ordinary skill in the art to keep the catalyst immersed for a time sufficient to regenerate the catalyst and optimize the length of time based on a balance between time constraints and level of regeneration achieved.

Regarding washing the catalyst after removing water from the catalyst, it would have been obvious to one of ordinary skill in the art to wash or rinse the catalyst if it were not suitably cleaned. Washing catalysts is a well known strategy in the art to prepare catalysts for use. Schneider '254 also teaches an embodiment of the process where the fluid is continuously pumped through the catalyst as in a scrubber. (claim 2)

The lack of a heavy metal treatment step is found to be inherent or obvious in view of Schneider '254. If there is no need to remove the heavy metals, such as if the catalyst did not contain heavy metal contamination, no heavy metals are contained in the water after regeneration or if the subsequent use of the water is not sensitive to heavy metal contaminants, the heavy water treatment is not necessary. Treating the

used regenerating water without a heavy metal treatment is not found patentable over the prior art.

7. Claims 12-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schneider '254 as applied to claims 1-11 above, and further in view of Sueyoshi, et al. (JP 53-125964).

Schneider '254 is silent as to how the catalyst is oriented when it is installed into a NO_x removal apparatus. Schneider '254 does not teach that the catalyst is inverted with respect to the direction of the flow of discharge gas when it is installed after regeneration.

JP '964 teaches an apparatus wherein a catalyst unit is placed in a device so that it can be easily inverted in order to ensure even deterioration of the catalyst. (page 2, left column, last paragraph) It would be obvious to incorporate this technique into the process of Schneider '254 in order to have the catalyst wear down more uniformly. One would be motivated to include catalyst inversion when installing in the process of Schneider '254 improve the overall health and lifetime of the catalyst and also the uniformity of reaction. Therefore, claims 12-15 are not found patentable over the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DIANA J. LIAO whose telephone number is (571)270-

3592. The examiner can normally be reached on Monday - Friday 9:00am to 6:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DJL

/Timothy C Vanoy/

Primary Examiner, Art Unit 1793